REMARKS

The present application has 18 claims pending, including independent Claims 1, 5, 6, 7, 8, 9, 10, 14, 15, 16, 17 and 18. Claims 8, 9, and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Na et al. (U.S. Patent No. 5,920,551) Claims 1-7 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Na in view of Ochel (U.S. Patent No. 3,764,913) and further in view of Grimwood et al. (U.S. Patent No. 6,243,369). Claims 1, 5-10 and 14-18 are independent claims.

The present application recites a method and apparatus for transmitting a time-discontinuous burst pilot channel being dependent on transmission data in a mobile communication system. In the apparatus, a modulator generates a modulated pilot symbol by generating an input pilot symbol at a designated phase and/or on a designated complex channel in response to an information bit input signal for designating the phase and/or the complex channel, and a spreader spreads the modulated pilot symbol from the modulator with an orthogonal code selected among a plurality of orthogonal codes. The burst pilot channel transmits side information being dependent on the transmission data according to the phase, and/or the channel and the orthogonal code.

"Side information" as recited in the claims of the present application represents information related to packet data transmitted to a user, for example, control information for controlling a transmission rate of a transmitted packet and a transmission rate of each group, and for determining whether the transmission is an initial transmission or a retransmission.

Claims 1, 5, 6, 8, 9,10, 14, 15, 17 and 18 of present application recite either an apparatus or a method for generating a modulated pilot symbol by outputting an input pilot channel data on one or at least one of a designated complex channel and at a designated phase according to an information bit for determining the respective complex channel or designated phase.

The Examiner asserts that Na discloses a channel structure for transmitting burst pilot channels in a CDMA mobile communication system (abstract) and further discloses pilot channels that are modulated by spreading with the Walsh function with an offset 0 in the burst pilot processing part 60 (fig. 2, col. 5, lines 1-7). After this modulation the pilot channels are spread with the I- and Q- channel pilot PN sequences, respectively (fig. 2, col. 5, lines 18-20).

However, with regard to the modulation, Na does not teach or suggest a modulator for generating, or a step of generating, a modulated pilot symbol by outputting an input pilot channel data at a designated phase *according to an information bit designating the phase*; or a modulator for generating, or a step of generating, a modulated pilot symbol by outputting input pilot channel data on a designated complex channel *according to an information bit for determining the complex channel.*

Because Na does not teach or suggest a modulator, or step, for generating a modulated pilot symbol by outputting an input pilot channel data on at least one of a designated complex channel and at a designated phase *according to an information bit* for determining the respective complex channel or designated phase, Na does not anticipate Claims 8, 9 and 16-18.

In addition, with regard to spreading a modulated pilot symbol, Na does not teach or suggest a spreader, or step, for spreading the modulated pilot symbol with an orthogonal code *selected according to the information bit* from a plurality of orthogonal codes as claimed in Claim 16. Because Na does not teach or suggest a spreader, or step, for spreading the modulated pilot symbol with an orthogonal code *selected according to the information bit* from a plurality of orthogonal codes, Na does not anticipate Claim 16 of the present application.

Ochel teaches a digital synchronous modem for synchronous FM transmission of binary coded data signal through cables and internal telephone lines (Abstract). Ochel relates to "in plant" data transmission lines where the lines are generally fixed interconnected telephony communication lines which are used for data transmission only and which are galvanically arranged to multipoint networks. Single sideband transmission is used to permit higher

transmission rate on the order of 1,200 bits per second. Coherent demodulation is used at the receiver end to recover the received signals to the base band by means of a signal corresponding to the carrier as regards to frequency and phase. The carrier is to be recovered from the received spectrum in the case of vestigial sideband transmission or from the pilot signals added at the transmitter end in the case of single side band transmission. However, Ochel does not teach or suggest a modulator for generating, or a step of generating, a modulated pilot symbol by outputting an input pilot channel data on a designated complex channel or at a designated phase *according to an information bit* for designating a least one of the phase and the complex channel.

As indicated by the Examiner, (Ochel- Col. 1, lines 26-37) Ochel fails to disclose the side information of the present invention. The single sideband transmission method disclosed in Ochel is a method of transmitting only one of a double sideband generated on both sides of a carrier by amplitude modulation and needs half the frequency bandwidth compared to a double sideband transmission method so as to efficiently use frequency bandwidth, which is not related to side information. In Ochel, information transmitted from pilot signals are used during the process of restoring the carrier in the single sideband transmission (See Col. 1, lines 33-37) and the information is information or a function generally provided by a pilot as a frequency and a phase reference, as described at Col. 1, lines 32-33 of Ochel. This seems to correspond to an amplitude reference provided by a burst pilot as described in the present invention. Therefore, the cited passages of Ochel as indicated by the Examiner fail to teach side information of the present application.

Grimwood teaches a bi-directional data communication system, which generates phase coherent upstream clock and carrier signals from recovered downstream clock signals generated from a master clock in a central unit. Grimwood does not teach or suggest generating a modulated pilot symbol by outputting an input pilot channel data on at least one of a designated complex channel and at a designated *phase according to an information bit* for determining the respective complex channel or designated phase.

Because neither Na, Ochel, nor Grimwood, alone or in combination teach or suggest a modulator, or step, for generating a modulated pilot symbol by outputting input pilot channel data on at least one of a designated complex channel and at a designated phase *according to an information bit* for determining the respective complex channel or designated phase, Claims 1, 5, 6, 10, 14 and 15 of the present application are patentably distinct from the teachings of these cited references.

Claims 7, 8, 9, 16, 17 and 18 of the present application recite a spreader or a step for spreading the burst pilot symbol, the modulated pilot symbol, with an orthogonal code selected *according to the information bit* from a plurality of orthogonal codes.

The Examiner also acknowledges that neither Na nor Ochel discloses a CDMA transmission method in which orthogonal spreading codes are used for spreading. The Examiner asserts that Grimwood discloses a CDMA transmission method in which orthogonal spreading codes are used for spreading transmitted data (Col. 14, lines 40-45) and further that different, orthogonal spreading codes are used to prevent interference between channels, and suggests that it would have been obvious to incorporate Grimwood's selection of an orthogonal code from a plurality of spreading codes into the combined teachings of Ochel and Na.

However, Grimwood also does not either teach or suggest a spreader for spreading the modulated pilot symbol with an orthogonal code selected *according to the information bit* from a plurality of orthogonal codes.

Because neither Na, Ochel nor Grimwood, alone or in combination teach or suggest a spreader, or step, for spreading the burst pilot symbol or modulated pilot symbol with an orthogonal code selected *according to the information bit* from a plurality of orthogonal codes, Claims 7, 8, 9, 16, 17 and 18 of present application are patentably distinct from the cited references.

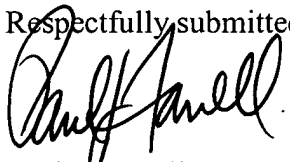
Furthermore, the Examiner acknowledges for Claims 1 and 10 that Na fails to disclose

burst pilot channel transmitting side information dependent on transmission data according to at least one of the phase, the complex channel and the orthogonal code, but relies on Ochel to remedy this shortcoming. Based on the above, because Ochel transmits single side band information only and the transmission of single side band information requires significantly less bandwidth than does the mobile communication of the present application, Ochel is non-instructive with respect to the teaching of burst pilot channel transmitting side information dependent on transmission data according to at least one of phase, the complex channel and the orthogonal code, where double side band information is necessary and delivered. Therefore, Ochel does not cure the deficiencies of Na with respect to Claims 1 and 10. Without Ochel, Grimwood does not remedy the shortcomings of Na acknowledged by the Examiner.

While not conceding the patentability, *per se*, of the dependent claims, Claims 2-4 and 11-13 are also patentably distinct for at least the above described reasons.

Accordingly, independent Claims 1, 5-10 and 14-18 and dependent Claims 2-4 and 11-13 are believed to be in condition for allowance. Early and favorable action is respectfully requested. Should the Examiner believe that a telephone conference or personal interview would facilitate resolution of any remaining matters, the Examiner may contact Applicants' attorney at the number given below.

Respectfully submitted,



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